

NOTE TO PTO PERSONNEL:
THIS PATENT APPLICATION IS BEING
FILED WITH SMALL ENTITY STATUS

CRANKSHAFT COUPLING STRUCTURE FOR ENGINE

BACKGROUND OF THE INVENTION

1. Field of the invention

The present invention relates to an internal combustion end and, more
5 specifically, to a crankshaft coupling structure for use in an engine to connect a
crankshaft to a piston and to increase the output torque of the engine.

2. Description of the Related Art

In a typical internal combustion engine, of the type found in most
vehicles today, a plurality of pistons are respectively movably mounted in a
10 plurality of cylinders formed in an engine block. Each of the pistons has one
end connected with a piston rod and the other end coupled to a crankshaft.
When spark plugs in the engine block fired to ignite fuel mixture, the pistons
are driven downward to turn the crankshaft, which ultimately drives the entire
vehicle. At present, in a typical engine, connecting rods are used and connected
15 with the respective first end to the corresponding piston and the respective
second end to the corresponding crankshaft. The connecting points between the
two ends of each connecting rod and the corresponding piston and
corresponding crankshaft are disposed at the ends of the longitudinal center
axis of the respective connecting rod. By means of the coupling of the
20 connecting rod between the corresponding piston and the corresponding
crankshaft, reciprocating motion of the piston causes the corresponding
crankshaft to rotate.

Presently, researchers have reported many studies to enhance the output

torque by extending the moving distance of the connecting rods between the pistons and the crankshafts.

SUMMARY OF THE INVENTION

The present invention has been accomplished under the circumstances
5 in view. It is one object of the present invention to provide a crankshaft coupling structure for engine, which greatly enhances the output torque of the engine.

It is another object of the present invention to provide a crankshaft coupling structure for use engine, which saves fuel consumption of the engine.

10 It is still another object of the present invention to provide a crankshaft coupling structure for engine, which improves the performance of the engine, resulting in reduced amount of solid matter in exhaust gas of the engine.

To achieve these and other objects of the present invention, the crankshaft coupling structure is installed in an engine and coupled between a
15 piston and a crankshaft, comprising connector pivoted to the crankshaft, the connector having a radially extended and smoothly arched sliding slot, a coupling rod member, the coupling rod member having a top end pivoted to the piston and a bottom end inserted into the sliding slot of the connector, and a
coupling member fastened pivotally with the bottom end of the coupling rod
20 member and received in the sliding slot and movable with the coupling rod member between two distal ends of the sliding slot. ..

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawing is included to provide a further

understanding of the invention, and is incorporated in and constitutes a part of this specification. The drawing illustrates an embodiment of the invention and, together with the description, serves to explain the principles of the invention. In the drawing,

5 FIG. 1 is a sectional view showing the crankshaft coupling structure coupled between a piston and a crankshaft according to the present invention.

FIG. 2 is a schematic drawing showing the action of the crankshaft coupling structure according to the present invention...

FIGS. 3A~3D are schematic drawings showing one moving cycle of
10 the crankshaft coupling structure with the piston from the top dead center to the bottom dead center and then from the bottom dead center back to the top dead center according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference will now be made in detail to the preferred embodiment of
15 the present invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers are used in the drawings and the description to refer to the same or like parts.

Referring to FIGS. 1 and 2, a crankshaft coupling structure is shown comprised of a coupling rod member 2, a connector 3, and roller assembly 4.

20 The connector 3 is pivoted to a crankshaft B by a pivot pin 31, having a radially extended smoothly arched sliding slot 30.

The coupling rod member 2 has a top end pivoted to a piston A by a pivot pin 21, and a bottom end inserted into the sliding slot 30 of the connector

3.

The roller assembly **4** is fastened pivotally with the bottom end of the coupling rod member **2**, and rotatably supported in the sliding slot **30**.

During reciprocating motion of the piston **A**, the roller assembly **4** is
5 forced to move with the coupling rod member **2** between two distal ends of the sliding slot **30**. When the roller assembly **4** moved to the right end of the sliding slot **30**, the coupling rod member **2** gives no pressure to the connector **3** and the crankshaft **B**. On the contrary, when the roller assembly **4** moving with the coupling rod member **2** from the right end of the sliding slot **30** to the left
10 end of the sliding slot **30**, the coupling rod member **2** imparts a pressure to the connector **3** and the crankshaft **B**, accelerating rotary motion of the crankshaft **B**.

Referring to FIGS. 3A~3D, when the crankshaft coupling structure moved with the piston **A** to the top dead center in the combustion engine, the
15 roller assembly **4** stays at the left end of the sliding slot **30** in the connector **3**. During the down stroke of the piston **A** from the top dead center in the combustion engine toward the bottom dead center, the roller assembly **4** is moved from the left end of the sliding slot **30** toward the right end of the sliding slot **30**. On the contrary, during up stroke of the piston **A** from the
20 bottom dead center in the combustion engine toward the top dead center, the roller assembly **4** is moved from the right end of the sliding slot **30** toward the left end of the sliding slot **30**. Therefore, the invention extends the stroke of the coupling rod member **2**, enhancing the output torque of the engine...

As indicated above, the crankshaft coupling structure of the present invention uses a roller assembly to couple a coupling rod member, which is pivoted to the piston, to a connector, which is pivoted to the crankshaft, by a slip joint. This arrangement greatly enhances the output torque of the engine.

- 5 Because the invention greatly improves the performance of the engine, it makes the engine to save fuel consumption and to reduce waste gas production.

A prototype of crankshaft coupling structure for engine has been constructed with the features of FIGS. 1~3. The crankshaft coupling structure for engine functions smoothly to provide all of
10 the features discussed earlier.

Although a particular embodiment of the invention has been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended
15 claims.